Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte JERRY D. CRIPE, GERARD T. REED and JAMES C. KOONTZ

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Appeal No. 2000-0034
Application 08/473,634

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ON BRIEF

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Before OWENS, LIEBERMAN and JEFFREY T. SMITH, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claims 18-33 and refusal to allow claim 34 as amended after final rejection. These are all of the claims remaining in the application.

THE INVENTION

The appellants' claimed invention is directed toward a method for decomposing a chemical compound. Claims 18, 33 and 34 are illustrative:

18. A method of decomposing a chemical compound comprising the steps of:

providing an energy source which generates energy;

providing a reaction chamber;

providing a member positioned in the reaction chamber;

heating the member with the energy of the source; and

introducing a flow of a chemical compound into a confined portion of the reaction chamber to impinge the member so that the chemical compound receives heat from the member and the chemical compound decomposes to form an end product and wherein no substantial deposition of the end product takes place on the member during decomposition of the chemical compound.

33. A method of decomposing a chemical compound comprising the steps of:

providing an energy source which generates an energy;

providing a reaction chamber;

providing a member positioned in the reaction chamber;

heating the member with the energy of the energy source;

providing a flow of a chemical compound into the reaction chamber; and

restricting the flow of the chemical compound into a portion of the reaction chamber so that the flow is introduced towards the member and the chemical compound decomposes to form an end product and wherein no substantial deposition of the end product takes place on the member during decomposition of the chemical compound.

34. A method of decomposing a compound comprising the steps of:

providing an energy source which generates energy;

providing a reaction chamber;

providing a member positioned in the reaction chamber;

heating the member with the energy of the energy source;

and

providing a flow of a chemical compound into the reaction chamber through a conduit, the conduit extending into a portion of the reaction chamber, wherein the flow of the chemical compound is generated as a result of processing a semiconductor wafer; and wherein the flow of the chemical compound exits from an exit end of the conduit such that the flow is introduced towards the member and wherein the exit end of the conduit is positioned at most a distance away from the member equal to 2 times the distance away from the member where a flow rate of the chemical compound exiting out of the exit end of the conduit does not backflow.

THE REFERENCES

Akashi et al. (Akashi)	4,386,258	May 31, 1983
Mundt	5,137,701	Aug. 11,

1992 Harada et al. (Harada)	5,183,647	Feb. 2,
1993 Aida	5,275,798	Jan. 4,

1994

THE REJECTIONS

The claims stand rejected as follows: claim 33 under 35 U.S.C. § 102(b) as being anticipated by Harada; claims 18, 30 and 31 under 35 U.S.C. § 103 as being obvious over Harada; claims 18, 21-24, 29, 30, 32 and 33 under 35 U.S.C. § 102(b) as being anticipated by Mundt; and claims 19, 20, 25-28 and 34 under 35 U.S.C. § 103 as being obvious over Mundt taken with Akashi and Aida.

OPINION

We reverse the examiner's rejections. We need to address only the independent claims, which are claims 18, 33 and 34.

Rejection of claim 33 under 35 U.S.C. § 102(b) over Harada

In order for a claimed invention to be anticipated under 35 U.S.C. § 102(b), all of the elements of the claim must be

found in one reference. *See Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991).

The appellants' claim 33 requires "restricting the flow of the chemical compound into a portion of the reaction chamber so that the flow is introduced towards the member".

Harada discloses a method for removing N_2F_2 impurity from NF_3 gas by heating the gas in a vessel which has a layer of nickel fluoride on its inner wall and may be packed with a solid fluoride (col. 2, line 49 - col. 3, line 8; col. 5, line 47 - col. 6, line 7). Harada teaches that neither the shape of the vessel nor the method for heating it is particularly limited (col. 3, lines 14-33).

The examiner considers Harada's wall/bed to be the component which corresponds to the appellants' member (answer, page 3). The examiner argues that Harada's gas feed pipe restricts the flow because the pipe has a finite diameter, and further argues that the gas is fed into a portion of the reaction chamber because the flow does not uniformly flood

every inch of the chamber (answer page 5).

The examiner's argument that Harada's gas flow does not uniformly flood the reaction chamber is unsupported by evidence or technical reasoning. Regardless, the appellants' claim 33 does not require that the gas does not uniformly flood the chamber but, rather, requires that the flow into the reaction chamber is restricted into a portion of the chamber. Because the examiner has not provided evidence or technical reasoning which shows that Harada explicitly or inherently discloses this limitation of the appellants' claim 33, the examiner has not established a *prima facie* case of anticipation of the method recited in that claim.

Rejection of claim 18 under
35 U.S.C. § 103 over Harada

The appellants' claim 18 requires "introducing a flow of a chemical compound into a confined portion of the reaction chamber to impinge the member".

The examiner argues that the confined portion limitation of claim 18 is met by Harada's entire reactor because the confined portion could be essentially the entire reactor, and further argues that it would have been obvious to one of

ordinary skill in the art to use a confined reactor in Harada's method because use of such a reactor ensures sufficient residence time to complete the reaction (answer, page 3).

Even if essentially Harada's entire reactor can be a confined portion of the reactor, the examiner has not provided evidence or technical reasoning which shows that the flow introduced into Harada's reactor is introduced into essentially the entire reactor rather than being introduced into the entire reactor. Moreover, the examiner's argument that one of ordinary skill in the art would have used a confined reactor to provide sufficient residence time for the reaction is irrelevant because what the appellants' claim 18 requires is not that a confined reactor is used but, rather, that the gas is introduced into a confined portion of the reactor. Because the examiner has not established that introducing Harada's flow into a confined portion of the reactor would have been fairly suggested to one of ordinary skill in the art by the applied prior art, the examiner has not carried the burden of establishing a *prima facie* case of obviousness of the method recited in that claim.

Rejection of claim 33 under
35 U.S.C. § 102(b) over Mundt

Mundt discloses a method for decomposing a chemical compound in a reaction chamber (18) which contains 1) a tubular reactive fibrous mesh (74) which interacts, preferably by chemical reaction, with the chemical compound, 2) a tubular effluent condensation element (76), and 3) a hollow cylindrical tube (80) which preferably is made of quartz or aluminum and serves as a waveguide for electromagnetic radiation used to decompose the chemical compound (col. 3, lines 19-33; col. 7, lines 1-2 and 22-53; col. 8, lines 12-31).

The examiner argues that Mundt's gas flow is restricted since it is delivered via a pipe of finite or limited diameter (answer, page 6). The appellants' claim 33, however, does not merely require that the gas flow is restricted but, rather, requires that it is restricted into a portion of the reaction chamber. Mundt indicates that the gas flow is to be unrestricted (col. 7, line 54), and Mundt's does not

illustrate the gas flow as being restricted into a portion of the reaction chamber (figure 3). Because the examiner has not established that this element of the appellants' claim 33 is found explicitly or inherently in Mundt, the examiner has not established a *prima facie* case of anticipation by Mundt of the method recited in that claim.

Rejection of claim 18 under 35 U.S.C. § 102(b) over Mundt

The examiner considers Mundt's hollow cylindrical tube (80) to be the appellants' member, and argues that Mundt's plasma heats the tube (answer, page 4). The appellants' claim 18, however, also requires that the chemical compound receives heat from the member. Such heat transfer would take place only if Mundt's feed gas, after passing through the reactive mesh and the glow discharge in annular passageway 68 (col. 9, lines 1-4), is at a lower temperature than the hollow cylindrical tube. Since the examiner has not established that such a temperature differential exists, the examiner has not carried the burden of establishing a *prima facie* case of anticipation by Mundt of the method recited in claim 18.

Rejection of claim 34 under 35 U.S.C. § 103

over Mundt taken with Akashi and Aida

Akashi discloses a high frequency magnetic field coupling arc plasma reactor wherein reaction material which is introduced into the tail portion of an arc plasma jet can pass through the central portion of a high frequency plasma flame, thereby enabling the total energy of the arc plasma jet and the plasma flame to be utilized (col. 1, lines 9-10; col. 2, lines 33-47).

Aida is relied upon by the examiner (answer, page 5) only for a disclosure of a 2.45 GHz frequency microwave energy source (col. 9, lines 49-50).

The appellants' claim 34 requires that the chemical compound flows into the reaction chamber through a conduit which extends into a portion of the reaction chamber and exits at a distance away from the member which is at most two times the distance away from the member where a flow rate of the chemical compound exiting the conduit does not backflow.

Mundt and Akashi are combinable, the examiner argues, because both perform chemical reactions (answer, page 6). The examiner argues that "Mundt appears to have an exit pipe at a location where back-eddies do not interfere with the main

process" (answer, page 6), and that it would have been obvious to one of ordinary skill in the art to use Akashi's gas inlet system in Mundt's method to provide gas inlets near the plasma to assure complete destruction of the chemical compounds (answer, page 4).

In order for a *prima facie* case of obviousness to be established, the teachings from the prior art itself must appear to have suggested the claimed subject matter to one of ordinary skill in the art. *See In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976).

The examiner has not provided evidence or technical reasoning which shows that Mundt and Akashi are combinable merely because they both disclose chemical reactions. Particularly, the examiner has not explained, taking into account the differences in the methods of Mundt and Akashi, e.g., that Mundt reacts the gas with a reactive mesh and Akashi injects the gas into a plasma jet, how one of ordinary skill in the art would have been led to combine the teachings of these references. Moreover, the examiner has not provided evidence or technical reasoning which shows any of the

following: 1) that Mundt's conduit exit is at the distance away from the member recited in the appellants claim 34, 2) that the applied references would have led one of ordinary skill in the art to modify Mundt's reactor to provide such a distance between the conduit exit and the member, or 3) that the conduit exit when Mundt is modified in view of Akashi as proposed by the examiner would be at such a distance from the member. The record indicates that the motivation relied upon by the examiner for combining the references so as to arrive at the method recited in the appellants' claim 34 comes from the appellants' disclosure of their method in the specification rather than coming from the applied prior art and that, therefore, the examiner used impermissible hindsight when rejecting that claim. *See W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); *In re Rothermel*, 276 F.2d 393, 396, 125 USPQ 328, 331 (CCPA 1960).

DECISION

The rejections of claim 33 under 35 U.S.C. § 102(b) over Harada, claims 18, 30 and 31 under 35 U.S.C. § 103 over Harada, claims 18, 21-24, 29, 30, 32 and 33 under 35 U.S.C. § 102(b) over Mundt, and claims 19, 20, 25-28 and 34 under 35 U.S.C. § 103 over Mundt taken with Akashi and Aida, are reversed.

REVERSED

TERRY J. OWENS Administrative Patent Judge	)
PAUL LIEBERMAN Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
JEFFREY T. SMITH Administrative Patent Judge	)

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Motorola, Inc.
Intellectual Property Dept.
P. O. Box 10219
Scottsdale, AZ 85271-0219